CLAIMS

What is claimed is:

1. A process for producing olefin(s) from oxygenates, the process comprising the steps of:

(a) contacting an oxygenate feed stream with an oxygenate-to-olefin catalyst to produce an effluent stream comprising water and olefin(s); and

(b) quenching the effluent stream with a quench medium having a pH above 7.0 to produce an olefin stream comprising olefin(s).

2. The process of claim 1, wherein the effluent stream further comprises carbon dioxide and the step of (b) quenching removes 5 wt.% or more of the carbon dioxide from the effluent stream based upon the total amount of carbon dioxide in the effluent stream before the step of (b) quenching.

3. The process of claim 1, wherein the step of (b) quenching removes 95 wt.% or more of the water from the effluent stream based upon the total amount of water in the effluent stream before the step of (b) quenching.

4. The process of claim 1, wherein the effluent stream further comprises alcohol and the step of (b) quenching removes 95 wt.% or more of alcohol from the effluent stream based upon the total amount of alcohol in the effluent stream before the step of (b) quenching.

5. The process of claim 1, wherein the effluent stream further comprises aldehydes and/or ketones and the step of (b) quenching removes from about 25 wt.% to about 95 wt.% of the aldehydes and/or ketones from the effluent stream based upon the total amount of aldehydes and/or ketones in the effluent stream before the step of (b) quenching.

6. The process of claim 1 wherein the effluent stream further comprises organic acids and the step of (b) quenching removes 95 wt.% or more of organic acids from the effluent stream based upon the total amount of organic acids in the effluent stream before the step of (b) quenching.

7. The process of claim 1, wherein the step of (b) quenching uses a quench medium that is an aqueous solution.

8. The process of claim 7, wherein the quench medium has a pH ranging from 7.1 to about 11.5.

9. The process of claim 1, wherein the step of (b) quenching produces a liquid fraction and a quenched effluent stream.

10. The process of claim 1, wherein the quench medium contains caustic.

11. The process of claim 1, wherein the effluent stream further comprises methanol.

12. The process of claim 1, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% alcohol based upon the total weight of the effluent stream before the step of (b) quenching.

13. The process of claim 1, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% methanol based upon the total weight of the effluent stream before the step of (b) quenching.

14. A process for making a polyolefin product comprising polymerizing the olefin produced in claim 1 to make the polyolefin product.

15. A process for making polyolefin(s) from an oxygenate feed stream, the process comprising the steps of:

(a) contacting an oxygenate feed stream with an oxygenate-to-olefin catalyst to produce an effluent stream comprising water and olefin(s);

(b) quenching the effluent stream with a quench medium having a pH above 7.0 to produce an olefin stream comprising olefin(s) with reduced total amount of water; and

(c) converting the olefin(s) to polyolefin(s).

16. The process of claim 15, wherein effluent stream further comprises carbon dioxide and the step of (b) quenching removes 5 wt.% or more of the carbon dioxide from the effluent stream based upon the total amount of carbon dioxide in the effluent stream before the step of (b) quenching.

17. The process of claim 15, wherein the step of (b) quenching removes 95 wt.% or more of the water from the effluent stream based upon the total amount of water in the effluent stream before the step of (b) quenching.

18. The process of claim 15, wherein the effluent stream further comprises alcohol and the step of (b) quenching removes 95 wt.% or more of alcohol from the effluent stream based upon the total amount of alcohol in the effluent stream before the step of (b) quenching.

19. The process of claim 15, wherein the effluent stream further comprises aldehydes and/or ketones and the step of (b) quenching removes from about 25 wt.% to about 95 wt.% of the aldehydes and/or ketones from the effluent stream based upon the total amount of aldehydes and/or ketones in the effluent stream before the step of (b) quenching.

20. The process of claim 15, wherein the effluent stream further comprises organic acids and the step of (b) quenching removes 95 wt.% or more of organic acids from the effluent stream based upon the total amount of organic acids in the effluent stream before the step of (b) quenching.

21. The process of claim 15, wherein the step of (b) quenching uses a quench medium that is an aqueous solution.

22. The process of claim 21, wherein the quench medium has a pH ranging from 7.1 to about 11.5.

23. The process of claim 15, wherein the step of (b) quenching produces a liquid fraction and a quenched effluent stream.

24. The process of claim 15, wherein the quench medium contains caustic.

25. The process of claim 15, wherein the effluent stream further comprises methanol.

26. The process of claim 15, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% alcohol based upon the total weight of the effluent stream before the step of (b) quenching.

27. The process of claim 15, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% methanol based upon the total weight of the effluent stream before the step of (b) quenching.

28. A process for making a polyolefin product comprising polymerizing the olefin produced in claim 15 to make the polyolefin product.

29. A process for purifying an effluent stream withdrawn from an oxygenate-to-olefin reactor, the effluent stream comprising olefin(s), water and carbon dioxide, the process comprising quenching the effluent stream with a quench medium having a pH above 7 thereby removing a majority of the water and removing at least a portion of the carbon dioxide.

30. The process of claim 29, wherein the process removes 5 wt.% or more of the carbon dioxide from the effluent stream based upon the total amount of carbon dioxide in the effluent stream before the step of quenching.

31. The process of claim 29, wherein the process removes 95 wt.% or more of the water from the effluent stream based upon the total amount of water in the effluent stream before the step of quenching.

32. The process of claim 29, wherein the effluent stream further comprises alcohol and the process removes 95 wt.% or more of alcohol from the effluent stream based upon the total amount of alcohol in the effluent stream before the step of quenching.

33. The process of claim 29, wherein the effluent stream further comprises aldehydes and/or ketones and the process removes from about 25 wt.% to about 95 wt.% of the aldehydes and/or ketones from the effluent stream based upon the total amount of aldehydes and/or ketones in the effluent stream before the step of quenching.

34. The process of claim 29, wherein the effluent stream further comprises organic acids and the process removes 95 wt.% or more of organic acids from the effluent stream based upon the total amount of organic acids in the effluent stream before the step of quenching.

35. The process of claim 29, wherein the quench medium is an aqueous solution.

36. The process of claim 35, wherein the quench medium has a pH ranging from 7.1 to about 11.5.

37. The process of claim 29, wherein the process produces a liquid fraction and a quenched effluent stream.

38. The process of claim 29, wherein the quench medium contains caustic.

39. The process of claim 29, wherein the effluent stream further comprises methanol.

40. The process of claim 29, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% alcohol based upon the total weight of the effluent stream before the step of quenching.

41. The process of claim 29, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% methanol based upon the total weight of the effluent stream before the step of quenching.

42. A process for making a polyolefin product comprising polymerizing the olefin produced in claim 29 to make the polyolefin product.

43. A process for quenching an effluent stream from an oxygenate-to-olefin reactor, the process comprising the steps of:

(a) providing the effluent stream comprising 40 wt.% or more water, from about 50 wppm to about 2000 wppm carbon dioxide and from about 40 wt.% to about 60 wt.% olefin(s) based upon the composition of the

effluent stream, the effluent stream further has a temperature above the dewpoint of the effluent stream; and

(b) contacting the effluent stream with an aqueous quench medium having a pH above 7 and a temperature below the dewpoint of the effluent stream.

44. The process of claim 43, wherein the step of (b) contacting removes 5 wt.% or more of the carbon dioxide from the effluent stream based upon the total amount of carbon dioxide in the effluent stream before the step of (b) contacting.

45. The process of claim 43, wherein the step of (b) contacting removes 95 wt.% or more of the water from the effluent stream based upon the total amount of water in the effluent stream before the step of (b) contacting.

46. The process of claim 43, wherein the effluent stream further comprises alcohol and the step of (b) contacting removes 95 wt.% or more of alcohol from the effluent stream based upon the total amount of alcohol in the effluent stream before the step of (b) contacting.

47. The process of claim 43, wherein the effluent stream further comprises aldehydes and/or ketones and the step of (b) contacting removes from about 25 wt.% to about 95 wt.% of the aldehydes and/or ketones from the effluent stream based upon the total amount of aldehydes and/or ketones in the effluent stream before the step of (b) contacting.

48. The process of claim 43, wherein the effluent stream further comprises organic acids and the step of (b) contacting removes 95 wt.% or more of organic acids from the effluent stream based upon the total amount of organic acids in the effluent stream before the step of (b) contacting.

49. The process of claim 43, wherein the quench medium has a pH ranging from 7.1 to about 11.5.

50. The process of claim 43, wherein the step of (b) contacting the effluent stream with the quench medium produces a liquid fraction and a quenched effluent stream.

51. The process of claim 43, wherein the quench medium contains caustic.

52. The process of claim 43, wherein the effluent stream further comprises methanol.

53. The process of claim 43, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% alcohol based upon the total weight of the effluent stream before the step of (b) contacting.

54. The process of claim 43, wherein the effluent stream further comprises from about 0.05 wt.% to about 5 wt.% methanol based upon the total weight of the effluent stream before the step of (b) contacting.

55. A process for making a polyolefin product comprising polymerizing the olefin produced in claim 43 to make the polyolefin product.